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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ZHENG, LOIS L

ART UNIT

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1793

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10/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/059,907	Applicant(s) HANSON ET AL.	
	Examiner LOIS ZHENG	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26,31-33,49-52,55-60 and 93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26 and 31-33 is/are allowed.
- 6) ☒ Claim(s) 49-52,55-60 and 93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 September 2008 has been entered.

Status of Claims

2. Claims 26, 49, 52, 55-57, 59-60 and 93 are amended in view of applicant's amendment filed 23 September 2008. Claims 1-25, 27-30, 34-48, 53-54 and 61-92 are canceled. Therefore, claims 26, 31-33, 49-52, 55-60 and 93 are currently under examination.

Status of Previous Rejections

3. Applicant's arguments regarding the use of check valves in Reid'798, filed 23 September 2008, have been fully considered and are persuasive. The rejections of claims 26, 31-33, 55-60 and 93 under 35 U.S.C. 102(e) as being anticipated by Reid et al. US 6,126,798(Reid) has been withdrawn.

Claim Objections

4. Claim 59 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

Art Unit: 1793

required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In this case, claim 59 recites "the microelectronic workpiece" which is already recited by independent claim 93 from which claim 59 depends on.

5. The examiner also suggests to change "electrode housing" on line 6 of claim 93 to "anode housing" for consistency purpose.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claim 49 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In this case, the amended feature of a conically-shaped pressure drop member having "no visible through openings" is not literally supported by the specification.

Pages 13-15 of the instant specification only discloses that the pressure drop member is a membrane that maybe fluid permeable or ion permeable and may be comprised of a filter type media or other media that at least partially restricts the fluid flow and prevents larger size particulates or precipitates. However, these teachings does not directly translate to "no visible through openings" because filter type media can have small

Art Unit: 1793

visible openings and still successfully perform the disclosed functions of a pressure drop member depending on the size of the precipitates for removal.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim 55 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 55 recites the limitation "the membrane" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 49-52 are rejected under 35 U.S.C. 102(e) as being anticipated by Reid'798.

Reid'798 teaches an electroplating apparatus comprising reactor having a processing space containing processing fluid(Fig. 2 #56A), an electrode housing having an open end(Fig. 2 #202), a conically shaped pressure drop member over the open

Art Unit: 1793

end(Fig. 2 #208) wherein the electrode housing and the pressure drop member defining an electrode chamber with an interior region, an electrode disposed in the interior region(Fig. 2 #206), a first fluid inlet(Fig. 2 #228, 234) and a first fluid outlet(Fig.2 #240,242) in communication with the interior region wherein a fluid tube is coupled to the first fluid outlet(Fig.2 #244,246), a second fluid inlet(Fig. 2 #200) and a second fluid outlet(Fig. 1 #54) in fluid communication with the processing space above the pressure drop member.

Regarding claim 49, Reid'798 teaches that the pressure drop member is a porous membrane(col. 5 lines 46-48). In addition, the instant claim 49 does not require that the apex of the conically shaped membrane is fully enclosed or does not have an opening. Therefore, the conically shaped pressure drop membrane as taught by Reid'798 has no visible through openings based on the broadest reasonable interpretation that the "no visible through opening" limitations can be interpreted to be directed to the membrane material itself. The electroplating apparatus of Reid'798 reads on the claimed electroplating apparatus.

Regarding claim 50, Reid'798 teaches that its conically shaped membrane is permeable(col. 6 lines 3-7).

Regarding claim 51, Reid'798 further teaches the claimed membrane frame(Fig. 2 #318,314,312,316).

Regarding claim 52, Reid'798 further teaches that is conically shaped membrane terminates in an apex directed toward the interior electrode member as claimed(col. 7 lines 41-43).

Art Unit: 1793

12. Claim 93 and 57-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Simpson et al. US 6,174,425(Simpson).

Simpson teaches an electroplating apparatus comprising a fluid vessel (Fig.3 #31), an anode in an anode housing (Fig. 3 #34 and area between #32 and #33), a pressure drop element(Fig. 3 #33) separating a first fluid flow region in the anode housing and a second fluid flow region above the pressure drop element, a fluid inlet (Fig. 3 #312) to provide processing fluid into both the first and second fluid flow regions, and a cathode(Fig. 4 # 362, 364) positioned to contact the microelectronic workpiece (Fig. 3 #20) while the cathode and the microelectronic workpiece are in contact with second fluid flow region. Base on the structure of the electroplating apparatus of Simpson, substantially all processing fluid movement between the first and second flow regions passes through the pressure drop element as claimed. Simpson further teaches a shield that is a field shaping element (Fig. 3 #37).

Therefore, the electroplating apparatus of Simpson anticipates the instant claims 93 and 57-60.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 55 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson, and further in view of Reid et al. US 6,126,798(Reid'798).

The teachings of Simpson are discussed in paragraph 12 above. However, Simpson does not teach that its pressure drop member is a conically shaped membrane terminating in an apex with an edge region of the membrane disposed closer than a central region of the membrane to the workpiece support.

Reid'798 teaches an electroplating apparatus comprising a conical shaped membrane(Fig. 2 # 208) disposed over the open top of an anode housing(Fig. 2 #202). Reid'798 further teaches outlets just under the edge regions of the membrane(Fig. 2 #240, 242) for removing trapped gas bubbles and plating solution from the anode housing for further filtering to move contaminants(col. 7 lines 60-55).

Regarding claim 55, it would have been obvious to one of ordinary skill in the art to have incorporated the conical shaped membrane and the outlets just under the edge regions of the membrane as taught by Reid'798 into the apparatus of Simpson in order to efficiently remove trapped gas bubbles and reduce the contaminants in the plating solutions from the anode housing. Therefore, the conical shaped membrane in the apparatus of Simpson in view of Reid'798 reads on the claimed pressure drop member. In addition, since Simpson teaches that the electrolyte is introduced from an inlet positioned below the pressure drop member, the conical shaped pressure drop membrane as taught by Simpson in view of Reid'798 would have terminated in an apex as claimed.

15. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson, and further in view of Reid et al. US 6,179,983(Reid'983).

Art Unit: 1793

The teachings of Simpson are discussed in paragraph 12 above. However, Simpson does not teach the claimed additional flow distribution element as recited in claim 56.

Reid'983 teaches an electroplating apparatus comprising a virtual anode comprising a flow distribution element having a plurality of openings positioned between the pressure drop membrane and the microelectronic workpiece(Fig. 2 #10).

Regarding claim 56, it would have been obvious to one of ordinary skill in the art to have incorporated the virtual anode of Reid'983 into the apparatus of Simpson in order to modify and control the electric current to achieve desired thickness coating deposit profile as taught by Reid'983(col. 2 lines 9-21).

Allowable Subject Matter

16. Claims 26 and 31-33 are allowed.

Response to Arguments

17. Applicant's arguments with respect to claims 52, 55 and 93 have been considered but are moot in view of the new ground(s) of rejection.

18. Applicant's argument with respect to claim 49 is not persuasive for the same reasons as set forth in the rejection of claim 49 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOIS ZHENG whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

Art Unit: 1793

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

LLZ